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THIS PAPER DESCRIBES GEOGRAPHY AS A COMPLEMENT TO HISTORY AND VICE VERSA. TOGETHER THEY SERVE TO INTERRELATE ALL HUMAN KNOWLEDGE WHETHER PHYSICAL, BIOTIC, OR SOCIETAL. HISTORY ATTEMPTS TO ASSOCIATE DIVERSE PHENOMENA IN AND THROUGH TIME. GEOGRAPHY, AS A CHOROLOGICAL SCIENCE, ATTEMPTS TO ASSOCIATE DIVERSE SPATIAL AND AREAL PHENOMENA, AND STRIVES FOR AN ARCHITECTURE OF DESCRIPTION IN SEGMENTS OF SPACE OR AREA. IT IS A SYNTHETIC AREAL SCIENCE WHICH USES THE ECOLOGICAL ASPECTS OF ALL THE SYSTEMATIC SCIENCES. THE GEOGRAPHER'S COURSE OF INQUIRY IS TOPICAL OR REGIONAL DEPENDING ON HIS EMPHASIS, AND HIS CONCLUSIONS ARE DETERMINED BY THE SCOPE OR SCALE OF HIS INVESTIGATION. HIS METHOD OF GATHERING GEOGRAPHIC FACTS MAY INVOLVE THE TOOLS OF MAPPING, PHOTOINTERPRETATION, STATISTICAL TECHNIQUES, AND EXPOSITORY REPORTS. GATHERED FACTS WHEN APPLIED TO CERTAIN SCALES (TABULAR OR GRAPHICAL PORTRAYALS) CONSTITUTE GEOGRAPHIC DISTRIBUTIONS. THESE DISTRIBUTIONS ARE ASSOCIATED WITH AREAS OF EARTH SPACE HAVING "RELATIVE HOMOGENEITY." COMPARABLE DISTRIBUTIONS ARE SET UP ON THE BASIS OF EITHER AREAL ASSOCIATION OR SPATIAL INTERACTION, DEPENDING ON WHETHER THE HOMOGENEITY OR DISTINCTIVENESS OF REGIONS IS BASED ON (1) THE AREAL ASSOCIATION OF ACCORDANT GEOGRAPHIC FEATURES OR (2) THE SPATIAL INTERACTION OF PATTERNS OF CIRCULATION (TRANSPORTATION AND COMMUNICATIONS). THIS PAPER WAS WRITTEN AS PART OF THE SOCIAL SCIENCE EDUCATION CONSORTIUM, A CURRICULUM PROJECT SET UP TO OUTLINE THE CONCEPTS, STRUCTURE, AND METHODS OF SEVERAL OF THE SOCIAL SCIENCES FOR USE OF TEACHERS AND CURRICULUM WORKERS AT ALL GRADE LEVELS. (JH)

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Publication #102 of the
Social Science Education Consortium

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FOREWORD

Professor Greco's paper, Geography, was written as part of a curriculum project supported by a developmental contract of the United States Office of Education, made with Purdue University for the Social Science Education Consortium. This project was directed by Lawrence Senesh, Professor of Economic Education at Purdue.

The purpose of the project was to outline the major concepts, structure and methods of several of the social sciences in a way that will be useful to persons concerned with either teaching or constructing new curriculum approaches and materials in which one or more social science disciplines has a prominent place. Papers similar to this one on geography have been written for anthropology, economics, political science and sociology.

Professor Senesh's immediate concern was to construct a broad curriculum outline for Grades K-6. However, the materials on the disciplines should be useful to teachers and curriculum workers at all grade levels.

Irving Morrissett

March, 1966

THE STRUCTURE OF GEOGRAPHY

I. HISTORY, GEOGRAPHY, AND THE SCIENCES

All earthly phenomena exist in time and space: they have a chronology and a chorology. History's principal domain is the former and geography's the latter. They complement each other. Together they provide a context which serves to interrelate all human knowledge whether physical, biotic, or societal (economic, social, political).

In the physical order, the meteorologist focuses his attention upon weather or, in more generalized form, climate. He attempts to understand the genetic aspects of meteorological phenomena (origins, processes) or what might be called "the physics of the atmosphere" and he may even study the distributions of certain generalized climate types. He pursues these interests, however, more to understand the nature of weather and climate than to understand the times and places in which these meteorological phenomena occur. He would doubtless know that the abundant precipitation of equatorial areas is related to solar radiation and the cooling of warm, moist air masses by convection. He might even note that these relationships have profound influence upon the mineral-deficient, acidic, red and yellow soils generally associated with them. But the human occupance of the tropical rainy areas, for example, would probably be of peripheral concern to him since such investigation is farther removed from his dominant interest--the nature of the tropical rainy climate type.

In the biotic order, the botanist is primarily concerned with the inherent characteristics (forms, life processes) of plants of given

species and may even be drawn to investigate the circumstances of the environment which determine the distribution of plant life on the face of the earth. As in the foregoing example, however, his analysis is directed by a specific intellectual disposition--to inquire into the nature of plants. Accordingly, whereas he will probably demonstrate that the existence of tall, broadleaf evergreens of many species in the equatorial areas of the world is related to the warm and humid permissive climate which is to be found there, he will be less concerned with the greater complexity of non-plant phenomena which characterize the tropical rain forest. As a practitioner of a systematic science, the botanist defines his field by a particular phenomenon--plants. His interest in the chronological and chorological aspects of plant study is tangential to his core concern.

Similarly, in the societal order, the economist might focus upon the nature of production and consumption of goods in native subsistence economics of the tropical rain forest; the sociologist upon the roles of management and labor in tropical rain forest plantation agriculture; and the political scientist upon the implications of tribalism for the emergence of viable political states in the same area. As in the physical and biotic orders, these specialists bring exhaustive and thorough knowledge to their inquiries.

As a borrower of much of this first-hand knowledge, it would seem that the historian of, say, "Twentieth Century Liberia" would have little of consequence to contribute. Without the historian, however, who would fill the need for a sysnthetic temporal science? Who would accept as his mandate, his raison d'etre, the illumination of the complex interrelations among those salient elements which in their totality connote "Twentieth Century Liberia," the understanding of which would contribute to an informed citizenry's comprehension of issues involved in world affairs?

Likewise geography. Like history, it is not defined by subject matter but by its method or the way it looks at things. Historical science studies the association of diverse phenomena in particular periods of time or in development through time. Geography, as a chorological or spatial science, strives for an architecture of description in segments of space or areas. It too attempts to associate diverse phenomena: it is a synthetic areal science which utilizes the ecological aspects of all the systematic sciences--physical, biotic, or societal. Thus, to continue the example already begun, the geographer would continue his investigation of "Twentieth Century Liberia" by borrowing as necessary from the several sciences. He would depict a tropical rain forest area within which poor circulation (transportation and communications) enhanced the social cleavage between indigenous Africans in the bush and the descendants of emancipated American Negro slaves who sought to subjugate their less-civilized brethren. He would find that a marginal subsistence type of slash-and-burn agriculture on quickly-impoverished soils was transformed by infusions of capital and managerial skill to produce significant earnings of foreign exchange via commercial plantings of natural rubber, the source of which requires the tropical rainy climate regime for its optimum growth and healing. Finally, he would discover that the indigenous people were induced to leave the social security of tribal subsistence life in the bush and become wage laborers on a Western island in a dissimilar cultural sea. By illuminating these areal relations, Liberia is set off from other areas with which it can be contrasted and compared. This--explaining areal differentiation--is the quest of the geographer. Space, the chorology of phenomena, is his principal concern.

The foregoing lacks sharp distinctions between the three kinds

of science: systematic, chronological, and chorological. Hopefully, this stems less from the imprecision of the writer than from the fundamental unity of all knowledge and what has been termed "the right of scientific trespass." Quite obviously, systematic scientific inquiry might uncover significantly interconnected phenomena about developments through time or in space. Thus, an economist will investigate the period of the great depression of 1929 and an anthropologist will relate habitats to certain socio-economic systems. Similarly, historians and geographers at times inquire into the genetic aspects of the phenomena they study, as in the case of the changing occupance of the Great Plains. Although studies overlap, however, the focus of concern is different in each case.

II. GEOGRAPHY

A. OVERVIEW

Today's world is a complexity of physical, biotic, and societal elements or facts, qualitatively and perhaps quantitatively defined, and exhibiting variety in space as well as variation in time. It is characterized by different kinds of land forms and varied amounts of rainfall; it has diverse types of forests and dissimilar crop yields; it exhibits contrasting traffic movement and population aggregations of all sorts and sizes. In his investigations, the geographer is concerned with the interconnections between sets of these elements or facts (physical and/or biotic and/or societal) which characterize specific places at specific times. His purpose is to locate geographic facts as they are assembled as sets or distributions in earth space and then by comparison, to explain how such geographic distributions are formally interrelated by areal association or functionally interrelated by spatial interaction. And since places so characterized obtain a certain distinctiveness of form or function,

he calls them regions. Regionalizing or generalizing about the relationships between and among sets of geographic facts in places (space) is the keystone of the geographic arch.

B. PRELIMINARY NOTIONS

At the outset, the geographer's course of inquiry will be topical or regional depending upon his emphasis; his conclusions will be determined by the scope or scale of his investigation; and his method will involve mapping, photo-interpretation, statistical techniques, and expository reports.

1. TOPICAL AND REGIONAL GEOGRAPHY

Like practitioners in history and the other social sciences, the geographer has pursued his research interests topically or regionally. In the first instance, he analyzes the interconnections of a certain phenomenon or type of phenomenon commonly in its world-wide distribution in order to assess the modifications of process that differentiate areas. In the latter case, he focuses upon a particular locale and explores the interlinked occurrences to better understand the uniqueness of that area. Thus, for example, the economic geographer as a topical specialist might be engaged in the world-wide study of rail transportation, generalize about the character of certain rail patterns, and subsequently demonstrate how these different patterns co-vary with other phenomena to confer a certain distinctiveness upon the places in which they occur: Soviet Siberia demonstrates a tentacle-like rail pattern which in turn is influenced by a great expanse of sparsely populated and underproductive land severely beset with physical problems (permafrost, pingos, windblown sand, annual flooding, etc.) which inhibit easy and inexpensive railroad construction; the Congo (Leopoldville) has an interrupted rail net which reflects the need

for portages for high-bulk low value commodities which are moved most efficiently on a river system which, as nature would have it, is obstructed with rapids and waterfalls. On the other hand, the regional geographer would restrict the scope of his vision to, say, Soviet Siberia and inquire into those sets of geographic facts which make it a unique place on the earth's surface. He would borrow the generalizations of the economic geographer on its railroad pattern and use the explanations for such occurrences that the systematic specialist has brought to light. He would, however, probably delve into such matters as the discontinuous settlements of the tundra through which no railroad courses; the canal construction of Soviet Central Asia and river transport to the Soviet Arctic, both of which supplement rail circulation; the planting of marginal lands to foodgrains for reasons quite beyond their proximity to existing rail lines; the emergence of Baykalia as an immense producer of cheap electricity based on falling water and a potential center of chemicals production based upon, not rail, but pipeline transmission of oil from the Volga-Urals district. Or, to take the Congo (Leopoldville) as an example, the regional geographer might consider, in addition to the nature of its fragmented rail pattern and associated export production, prudent slashing and burning of forest cover in a climate zone where soils become rapidly impoverished once the vegetative cover is removed; the artificial political boundary which separates Bakongo tribesmen from their kin in the Congo (Brazzaville) and which weakens effective central authority; and the high infant mortality rate of pygmy peoples in the eastern Congo, based upon isolation from modern medicine and a physical environment which assists the spread of disease.

We might say that if geography studies phenomena in places to differ-

entiate one area from another, the topical geographer begins with phenomena and the regional geographer with places. But all phenomena occur in places; and the areal differentiation of places presupposes the existence of varied phenomena within them. Therefore, topical and regioanl geography differ not in kind but in emphasis. They both involve analysis and synthesis. They are inextricably intertwined in all comprehensive geographic study.

2. SCALE

The conclusions which the geographer may infer from his inquiry will be determined by its areal scope or <u>scale</u>. Theoretically, the scope may range from a point on the globe, mathematically defined, to the whole of the earth's surface. Realistically, however, the scope of the area subjected to inquiry must be <u>comprehensible</u>; and to the extent that it is defined in terms of the interests of the researcher, it must be <u>meaningful</u>. All aspects of the earth's varied surface are not simultaniously comprehensible and an indefinite number of points is not meaningful.

All scientific inquiry is based upon the assumption that the plethora of detail evident in today's world has an inner logic and can therefore be studied and understood. The geographer assumes that there is a certain <u>order in nature</u> and that <u>man rationally organizes himself in space</u>. In order to cut through the welter of detail that he finds in segments of earth space which are larger than points, he generalizes not unlike other scientists. On a large scale map (which approaches the 1:1 ratio of reality), he is able to locate many sets of geographic facts and relationships between or among them about which he might generalize. However, as the map scale decreases (or further departs from the 1:1 scale of reality), some of the assemblages of geographic facts (which might have been quite

prominent on the large scale map) dwindle to insignificance. The richness of detail on the large scale map must necessarily be reduced as the area represented on the large scale map assumes a small portion of a larger segment of earth space portrayed on the small scale map. Hence, in large scale studies, generalizations tend to be more numerous but particular. In small scale studies, generalizations tend to be fewer but broader.

However, the foregoing should not be construed to mean that large scale studies have greater utility than small scale investigations. While he loses the particularity of large scale studies in small scale inquiries, the geographer acquires through the latter a meaningful sweep which characterizes broader segments of earth space. A house is an assemblage of facilities. To the prospective owner, however, detailed knowledge about each facility might not be so significant as knowledge of the community in which it is located. So too with the building blocks of reality and the superstructure of which they form a part.

3. TOOLS

The map is an important tool, but not the only one, for geographic investigation. After deciding whether he will concentrate on the geographic distributions of a particular phenomenon in different areal contexts or on several phenomena in one study area, and after he has selected a scale suitable to the inquiry at hand, the geographer analyzes a given area or areas by means of first-or second-hand observation (field work, photo-interpretation, written reports) and he prepares therefrom either tabular or graphic portrayals or both.

The simple table or bar graph can reflect the location of specific physical, biotic, and societal elements, qualitatively and perhaps quantitatively defined, and occurring in time. For example, the geographer

might record for a given number of counties in Iowa (location) the proportion of acreage devoted to corn production (quality and quantity of a phenomenon) in a certain year (time). This constitutes a tabular or graphic array of a set of geographic facts or portrayals of a geographic distribution. Conceivably, he could prepare a table or bar graph of another geographic distribution, say, of cattle production in proportion to total agricultural production for the same counties in Iowa and for the same year as above. If the investigator then prepared a scatter diagram consisting of a graph on one axis of which was marked increasing values of the one variable, proportionate acreage devoted to corn, and on the other axis, increasing values of the second variable, cattle production in proportion to total agricultural production, he would be able to plot a series of points which, if grouped around a straight or curved line, would establish visually and subsequently, statistically, that somehow these two variables may be related. However, the simple fact that the two distributions are accordant does not demonstrate that they are causally related. It is incumbent upon the investigator to show that the accordance can be interpreted in terms of systematically related processes operating through time.

A more distinctively geographic portrayal of assemblages of geographic facts is the map. It too is graphic but besides having the propensity for revealing the location of qualitatively and perhaps quantitatively defined facts in time (as can the table or bar graph), it supplies something more. It shows relative location by means of which distance and shape relationships can be seen more easily. For example, geographic distributions have a certain dispersion or spread (over a distance) and a certain pattern or arrangement (or shape) of the geographic facts which constitute

them. The table and bar graph have no way of showing how the unit areas (the counties of Iowa, for example) are situated in relation to one another. The use of tables or bar graphs which perhaps consist of a random listing of counties, therefore, would not reveal whether there is one focal area of intensive corn-cattle production or several. Since productivity seldom conforms to county lines, the magnitude (shape) of the area showing the greatest co-variation cannot be known. The user of the table or bar graph would have data on the distribution of a certain set of geographic facts but they would be for necessarily discrete areas. Lost to him are all the suggestions for further inquiry which would emanate from the joining of these discrete segments one to the other so that a continuity, a certain gradation in intensity of corn-cattle production, could be established. If the shape of the most intensive corn-cattle producing area was known, for example, the geographer could be guided by his knowledge of the counties or parts of counties so conjoined to investigate other geographic distributions on those conjoined areas in his quest to determine other processes which relate to the occurrence there of significant corn-cattle production. On the other hand, if the geographer could establish the fact that intervening earth space (distance) separated several focal areas of production, this would suggest that there exists a certain organization of areas of intensive corn-cattle production with others not similarly characterized, each having complementary functions and tied over distance by a certain pattern of circulation. His exploration of such a hypothecated functional design has the potentiality for further illuminating why and how intensive corn-cattle production has come into prominence in certain areas.

The foregoing, however, should not be understood to imply that the map is always more significant a tool in geographic research than statistical

techniques. For example, soils may be classified as geographic distributions by similarity of characteristics. Their form and structure, however, are extraordinarily complex. If the geographer decided to explore the nature of soils in the Iowa counties of intensive corn-cattle production, for example, the generalizations that he must necessarily make to portray geographic distributions might exclude the more significant differences of soils which would be favorable or unfavorable for optimum corn yeilds. What is the texture of the soil? Is the water table high? How deep is the topsoil? Is there an impervious layer underlying the topsoil and if so at what depth? What is the slope of the terrain? A plethora of maps would presumably be necessary to illuminate the interconnections between soils and significant corn-cattle economics. At best, however, it would appear that soil and corn-cattle distributions would only be vaguely similar: soils are more than the sums of their characteristics. Geographers have used simple and multiple regression and correlation to good advantage in such problem situations although such techniques are probably too sophisticated for average elementary and secnndary school students.

C. AREAL ASSOCIATION

We have hitherto paid attention to those elements of today's world which can be thought of as geographic facts. We have seen how scale affects the generalizations which can be made about sets of geographic facts or geographic distributions. We have touched upon the method by which geographical distributions are areally related. It seems to be worth while to resume at this point by initiating commentary on another meat animal producer, the Humid Pampa of Argentina, while we continue to pay heed to the foregoing Iowa example.

The distributional patterns that the geographer singles out from earth

space are a function of his research interests. Thus he might inquire into cattle production around the world as a question of cause-effect to be answered. He decides to focus his attention on Iowa and the Humid Pampa, among other areas. He spearates the geographic facts which seem to be relevant to the question, establishes distributional patterns for each of them, and attempts to show accordance through map or statistical analysis. Thus he might plot data on cattle and fodder production for each areal context and exclude data on motor vehicle deaths and wine production. If the distributions of cattle and fodder production co-vary areally and the geographer can relate them via the operations of systematic processes, he concludes that one distribution helps to explain the other so correlated. This is an areal association. He concludes that the generalized accordant boundaries delineate certain distinctive segments of earth space (in Iowa and Argentina) because of two areally cohesive characteristics (cattle and fodder production) which, on the scale of his observation, pervade each whole. These areas of earth space which display throughout a greater or lesser intensity of these associated traits (or what the geographer calls "relative homogeneity") are labelled regions. And since they are defined by formal features, his cattle-producing regions of Iowa and the Humid Pampa are termed uniform regions.

Having done this, the topical geographer compares his uniform regions and notices that corn is associated with Iowa cattle production whereas alfalfa predominates in the Humid Pampa. Further analysis sheds light on this difference. The distribution of large landholdings in the Humid Pampa, unlike its Iowa counterpart, permits extensive rather than intensive agricultural methods. Corn, eminently suited to the hot and humid summers of Iowa, is unsurpassed in per acre fodder yield. In the Humid Pampa, on the

other hand, a year-long mild climate permits the easy growth and over-wintering of deep-rooted, drought-resistant alfalfa which thrives on the rich, deep, well-drained, fine grained, loessial soils of the region.

Further analysis proceeds apace. Each region has certain societal elements (transportation nets, farmsteads) which are deemed to be relevant to the crop-meat animal association that served to define each. Roads and rail lines course Iowa, bringing in lean range cattle and bringing out finished steers. Roads are notably absent in the Argentine context but railroads carry fattened cattle directly to Buenos Aires dressers of beef. The processes of meat-animal production explain the different roles played by the two regions: on Iowa farms (which are not so large as to prejudice a family livestock operation and yet not so small as to make, say, the more labor intensive production of hogs alone feasible), it is more efficient to fatten lean range cattle in transit to easterly markets rather than to breed your own steers or to ship fodder to the Western range country. In Argentina, the enormous estates and lush, nutritious pasturage obviate the need for a similar response. The lack of roads in the Humid Pampa transportation pattern is largely influenced by the dearth of high bulk-low value road grading materials in the pebble-free, deep, loess.

If the topical geographer were to presume that the character of the farmstead had implications for making his uniform region more comprehensible and meaningful, he might portray the distributions of animal shelters. He would find that Iowa evidences numerous large barns for the sheltering of hay and cattle but that the Humid Pampa has no similar cultural pattern. In the Midwest, the cold winters require animal shelters (and often the old horse barn has had new tenants) but the mild Pampa winter permits the over-wintering of cattle on the open range.

The reader will note that the procedures of areal analysis and comparison have illuminated features which meat animal producing regions share in common as well as those that differentiate them. Their determination permits the geographer to establish broad regional requisites for this industry and these have implications for further investigation. For example, the geographer might consider the changes in localized associations that might improve the quality or quantity of production; if these prospective changes are transferable from one region to another; and how these changes might alter the stability of a given undertaking.

If, on the other hand, the geographer's reaearch interests are motivated less by the desire to compare geographic distributions for a particular phenomenon in different parts of the world but more by the inclination to look at many sets of geographic facts for a special segment of earth space, say the Humid Pampa, he would attempt the greatest possible systhesis of features as analyzed in the foregoing or as contributed by other systematic specialists. He would, no doubt, study the growth of an urban industrial force which stemmed from the natural increase of European immigrant agriculturists and which found political, economic, and social attractions in Buenos Aires. Similarly, the constant rise in wheat and corn farming which has transformed the Humid Pampa into a granary as well as a beef producer would also probably attract him as would the nature of, say, the truck farming zone outside the primate city. The regional geographer who focuses on Iowa might look at the current productive association in its evolution through time, assess the bases for average farm size and perhaps even try to determine why tenancy characterizes so great a proportion of farm occupancy.

D. SPATIAL INTERACTION

We have seen how analysis and synthesis with repeated comparison is a hallmark of geography. We have, however, attended to uniform regions only. It remains for us to consider regions of the nodal type and the concomitant geographic concept of spatial interaction.

When regions are constructed so that their homogeneity or distinctiveness is not based upon the areal association of features which with greater or lesser intensity pervade their wholes, they may attain homogeneity through the spatial interaction of their associated distributions which is, in turn, made possible by their internal design or structure. The uniform region is morphological and primarily static; the nodal region is functional and primarily dynamic: the former might consist of physical and/or biotic and/or societal distributions; the latter commonly involves societal distributions with or without distributions from the physical and/or biotic orders.

The core assumption undergirding the nodal region is that society organizes itself spatially. Accordingly, there are focal points of control and influences (or movements) which radiate to certain boundaries. Thus, for example, Buenos Aires is a focal point in the Humid Pampa by virtue of its role as a center of political authority and because of the influence it exerts upon the surrounding productive region as a rail hub and port. A study of Buenos Aires as the focus (central place) of the Humid Pampa considered as a functional region would involve the geographer in uncovering the nature of and the ties between those sets of geographic facts (or geographic distributions) which lie within the central place and its hinterland or tributary area which determines the size and specializations of the central place. Similarly, Iowa meat producers have ties to

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producers of strong but lean range cattle and meat consumers farther east. The geographer might explain how and why Iowa feeder-lots are functionally interrelated with points of origin and market which may lie within or without the meat-animal producing region. Characteristically, a pattern of circulation (transportation and communications) binds the central place to its associated outliers so that the special functions each performs are part of an integrated structure (or heirarchy) of functions exhibited by every nodal region. Therefore, although nodal regions are necessarily quite specific (conceived on a large scale),comparative analysis of nodal regions of the same type may be undertaken to lend insight into the ways in which different economies function.

Finally, it remains for us to realize that uniform and nodal regions are not entirely unrelated. Every uniform region which is composed wholly or partially of societal distributions must have a specific location in earth space. Its location in relation to other places (situation) makes it more or less accessible to them. Accordingly, it may function as a focus with respect to any number of outliers or may itself be associated within one or several hinterlands of another central place or of other central places. Furthermore, since functional relationships take on a certain form, the nodal region may be said to display a certain uniformity. Hence it would seem that both kinds of regions may be used together in the task of areal differentiation. In the section that follows, two examples will be furnished to illustrate uniform and functional regions which, so unified, might be said to confer upon each of them a certain "personality". In this task, the geographer attempts the greatest synthesis of features from the foregoing examples; is further drawn to explain how those sets, along with others not as yet considered, have come to be areally associated or functionally

interrelated or both; and how together they represent, in large measure, the significant character of the human occupance of these two regions.

E. COMPREHENSIVE REGIONAL STUDIES

1. THE HUMID PAMPA

The Humid Pampa is today the heartland, the core, of Argentine life. Yet it was not always characterized as an area of primary significance. Indeed, in the era of Spanish colonial rule, the Humid Pampa, with the same physical underpinnings it possesses today, was tributary to the areas in the Andean Highlands where the proximity of precious metals to local Indian populations attracted the conquistadores to a profitable "robber economy." The extensive grasslands and equable temperatures of the Humid Pampa had no similar mineral wealth to offer, and hostile Indian groups in the locale did not constitute an exploitable labor supply. Accordingly, the Humid Pampa came to be characterized by an extensive (rather than intensive) grazing economy in which crude gauchos bred sure-footed and strong mules for the transportation needs of the upland ore producers whose exports were oriented toward the Pacific and Caribbean. For food requirements, Spanish longhorns were left to range on the native pastures. By decree, direct sea trade was prohibited for the occupants of the Pampa and although gauchos were engaged in profitable smuggling, they had to look to the route through the then great city of Asuncion, upstream on the Rio de la Plata, for the preponderant part of their other needs.

As time unfolded, however, the moderate climate, good pastures, lack of natural enemies, and small demand for beef permitted great increase in the herds. If hides or tallow from the steers could be marketed, the animals were characteristically butchered on the open range and their carcasses

left to rot; wool could be had from sheep most easily by killing the animal in the pastures and by pulling the wool from its body. There was no significant market for Pampa beef: before the Industrial Revolution, productive economies of the North Atlantic Basin were largely self-sufficient; cities were small and those that had grown large from trade could find little reason to send vessels so far when it constituted antagonizing the Spanish court, acquiring a commodity which their nations already had in adequate supply, and gaining a foreign market of no significant size.

However, after Argentine political independence and the recognition of individual propriety rights to large estates in the Humid Pampa, a new industrial technology took root in England and transformed it into an island of factories with concomitant agglomerations of workers who left the vegetable gardens, farms, and livestock pens of the countryside for the industrial wages of the city. Value added by manufacture made for a thriving English economy but its ever-enlarging urban workforce had to be fed. The invention of the refrigerated vessel in 1877 made possible the shipment of large quantities of chilled beef (as distinguished from dried or salted beef as theretofore) to a good English market. Unfortunately, the lean, stringy beef was not suited to English taste.

How could the Argentine land baron improve his herds? Selective breeding was impossible in open range country where few trees existed for fencing material and where pebbles, let alone stones, could not be found. The invention of barbed wire furnished him an inexpensive fencing material. Accordingly, he began to improve his stock by importing pedigreed animals from England. But quality beef is predicated on more than quality stock: the estate owner had to improve his pastures. In the deep, fine-grained, rich, and well-drained loessial soils of the Humid Pampa, the deep-rooted

nutritious and productive legume, alfalfa, could be grown readily enough. But the landed gentry, like the O'Hares of Tara, would not condescend to perform manual labor. Neither would the gaucho, who shared with his mounted brethren the world over a haughty disdain for the "sodbuster." The steel plow had recently been invented. To whom could the landlord turn to plow under the tall native bunch grass, to break the thick-sodded European grass?

Another historical phenomenon solved his problem. When in the 1880's, southern Europe began to disgorge hundreds of thousands of landless peasants to the Americas, not a few of them migrated to Argentina. There, labor contractors commissioned by the land barons were able to obtain sharecroppers for the huge estates. In return for an assured fixed term of tenancy and a share of the crop he raised, the immigrant promised to leave the land under alfalfa. Since wheat or corn culture was found to be admirably suited for the preparation of the soil for alfalfa, the sharecropper became a grain farmer for three or four years. After his tenancy terminated and the parcel was left under alfalfa, the landlord was content to have the farmer repeat the cycle even perhaps on an adjoining parcel. The result was the progressive improvement of pastures and a boon to the meat animal industry.

English capital underwrote further Argentine development. Railroads and other essential economic overhead were constructed. Meat-packing plants in and around the improved port of Buenos Aires made it a premier economic focus with significant transportation functions.

As time unfolded, the wealth of the Humid Pampa based on cattle came to share prominence with an increasingly significant production of grain. Wheat and corn culture, which represent a more specialized and intensive type of land use, had its basis in the same nature-given physical endowment of the Pampa but with new and significantly different cultural phenomena--an

increasing agricultural labor force which consisted of an immense immigration and its offspring who were undaunted by the prospect of manual labor; and increased demand for these widely used foodgrains in the burgeoning industrial states of the Northern Hemisphere which found in the April harvest of the Southern Hemisphere a well-timed supplement for their stocks and larders.

Throughout modern Argentine history, this grain-meat economy made for the wealth of the few and a signally stratified Argentine society. The agriculturists had a feeble voice in politics. Their sons and brothers who had left the farm for the packing plants and other light industries of Buenos Aires were more active indeed but had no spokesman. The army and the Church and the landed aristocracy stood in formidable array against them as supporters of the regime--active or silent in behalf of the status quo. The success of the Peróns rested upon their astute observation that the economic satisfactions of the industrial worker were not a sufficient counterweight to his felt need for social status; and that their use of this emerging social revolution would adequately offset the military support which brought Juan Perón to power. Forced sales of wheat, corn, and meat to the State at low prices and their resale abroad at prevailing world prices served to enrich the Peróns and the government at the expense of the landed gentry--and this pleased the urban worker. The funds so gained,along with reckless new issues of currency, enabled the Peróns to increase industrial wages and pemmitted the easier repayment of debts engaged in when money was "harder." The "shirtless ones" of the factories stood staunchly behind them,and even after Juan Perón's ouster his vote-getting ability continued to be significant. The Peróns captured a revolution-in-the-making. If they served it at all, it was only perhaps

in having made the blue-bloods aware of a different kind of hunger in their midst.

Argentina has not yet had its social revolution. Buenos Aires today is one of the premier cities of the world. Industries, light and heavy, wise and questionable, have emerged in and around the great metropolis. And it is not unreasonable to assume that the advantages of the Pampa and Buenos Aires will make for even greater growth. But if the quests of Western man are fundamentally similar, changes of a different kind will ensue,and Buenos Aires and the Humid Pampa, the core of Argentina, will evolve into notably different forms as it has throughout its history.

2. IOWA

Today as in yesteryear, in the physical order of things, Iowa is a product of its situation within a large land mass. It possesses a climate regime characterized by cold and dry weather in the winter and heat and moisture in the summer. An end-product of glacial activity in geologic time, its level to moderately rolling terrain consists largely of rich dark drift which is deep and porous.

It is axiomatic in modern geography that the meaning to man of his physical environment is a function of his attitudes, objectives, and technology. Iowa's contemporary renown as an extraordinary producer of grain and meat animals is, without question, based upon nature's gracious endowment. However, it is at least equally a cultural acheivement.

The occupance of what is today Iowa was, in its origins, not unlike Western man's use of most virgin lands. The trapper and trader were attracted to fur-bearing animals particularly around the Des Moines River; the first white settlement was based on lead mining. As the agricultural frontier moved westward, however, these exploitative or "robber economies"

gave way to forms of occupance characterized by greater labor and capital inputs although, admittedly, not without incidents where the soil was "mined" rather than managed.

Those Europeans and their descendants who moved westward to farm were products of their environment and culture. They and their forebears had sprung from a humid forested region which provided the material means for shelters, fences, tools, and fuel. Indeed, it was a general attitude among colonists that unforested land was unproductive: the word "barrens" connoted more than treeless areas. When they left the forested East, happily, they were introduced to the prairie along river courses and in the transitional zone between forests and grassland where these two biotic phenomena were interspersed. In these openings, timber was available for their traditional needs and the nearby grasslands, with sod considerably easier to plow than genuine prairie grass sod further west, were readily convertible into productive farms.

When the pioneer farmer confronted the prairie proper in Iowa, however, the sea of grass represented entirely new conditions and demanded a technology that had not yet been developed. Many, in fact, were drawn instead to the forested Pacific Northwest which to them was a more attractive alternative. On the prairie, an assured supply of drinking water could only be had by digging wells with pick and shovel usually for between 100 and 200 feet; rock and timber to line the well had to be hauled from a distance. The wooden and cast iron plows that performed well enough in cleared forest lands did not scour clean readily enough in these clayey grassland soils.

In one culture, the general attitude toward life consists of being in harmony with nature. In another culture, whose attitudes are differently oriented, nature is to be subjected to that culture's needs. If its

technical abilities are inadequate to the task, the facets of nature become determinants or restrictions; if, however, it can muster a varied technology, nature poses only temporary problems. Exemplifying the last case, within a short time span, there intruded onto the prairie a set of new inventions which changed its meaning for Americans. The drilling machine provided wells and the windmill harnessed the wind which blew unobstructed over the level terrain, easily drawing water to the surface. The steel plow scoured easily. Barbed wire permitted the construction of inexpensive fences which offered minimal resistance to wind and drifting snow.

These phenomena permitted the conquest of space. The character of the conquest, cast in a distinctive mold, was, again, a product of environment and culture. Lack of accessibility to surrounding areas suggested the prudence of using easily available materials for immediate human needs: the sod house and the use of twisted dried grass "cats" and dried cattle or buffalo dung for fuel were customary. Since farming was initially of the subsistence type, cattle for milk and meat as well as for draft and manure were adjuncts to a general type of mixed farming. Certainly this was a far cry from colonial days when some of their forebears in the East sought laws prohibiting the slaughter of oxen less than seven years old and when barns were abandoned when they were too full of manure. It was, however, equally remote from agricultural patterns which came with the invention of harvesting and threshing machinery and the railroad. By these innovations, surplus production was made possible and meaningful, and through them the farmer came to possess more of the amenities of life.

Prairie soils lacked road-surfacing materials, and rivers in the region were less navigable than those in the East. The intrusion of the civilizing

rails overcame this frustrating friction of distance and tied the excess production of the prairie, made so easy by new agricultural machinery, to the markets of the urbanizing East. Wheat was the first premier crop and by 1870, Iowa production was second in rank by states. Cattle herds that ranged on lush, abundant pastures were easily increased when general industrial prosperity and military needs in the North during the Civil War occasioned a greatly increased consumer demand for beef. After the War, however, the availability of immense numbers of Texas Longhorns (which could not be marketed during the conflict) and the occupance of the Great Plains by cattle ranchers created a significant change in the character of Iowa production. With minor fluctuation, it has persisted to this day. It became less costly, and therefore more profitable,for Iowa farmers to buy cheaply produced, lean but strong, range animals and fatten them in their own feeder lots. This induced changes in the crop-animal association that hitherto prevailed: first, since it was a better fodder crop, corn replaced wheat and the latter, more tolerant of climatic extremes than corn, occupied drier and cooler lands farther west in the Great Plains; and second, the Iowa farmer found further fortune in converting his livestock, which formerly supplied steers for his feed lot, into purebred herds to meet the demand of western stockmen for quality breeding cattle.

Today, the Iowa cattle finisher raises corn, oats, and soybeans or hay in rotation, with corn commonly occupying half his acreage. Oats are unsurpassed as a grain in balanced nutrition for animal bone and muscle; the soybean is a legume which yields valuable oil and a nutritious hay. Usually, the meat-animal producer buys significant amounts of corn from cash grain farms to supplement his own fodder supply, which, great as it is, cannot carry the large number of animals he finishes for market. He

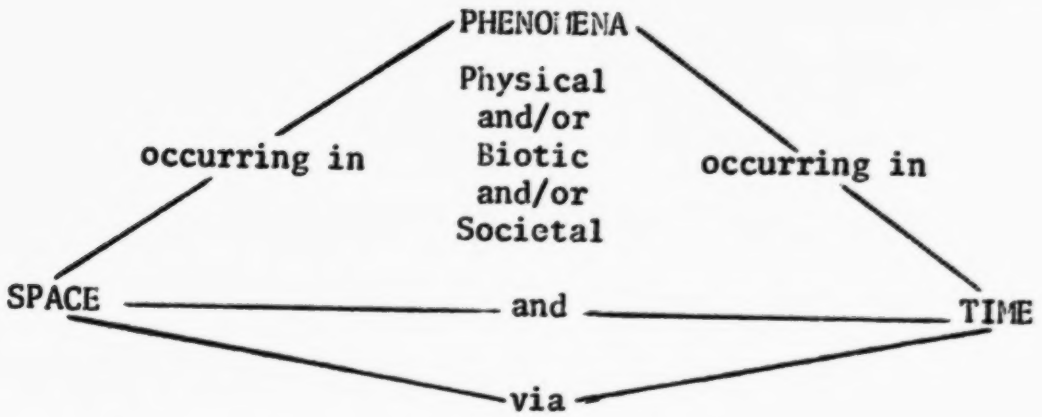
may, in addition, raise hogs, either as scavengers of corn which pass through the cattle undigested, or as an additioanl operation to insure him against cattle price fluctuations. His livestock holdings in any given year are customarily worth tens of thousands of dollars and exemplify intensive stock-rearing, quite the opposite of Pampa patterns. No wonder then that the Iowa farmer bolts when he hears "foot and mouth disease." Seldom fatal, this ailment conspires to reduce the amount of feed that cattle or swine will consume. The Iowa feeder lots, unlike vast Pampa estates, cannot profit from cattle that must be carried in quarantine until cured.

The size of the Iowa farm is not large: the Homestead Act created parcels far smaller than Argentine estates or Texas ranches. And since from the earliest days of agricultural settlement in Iowa the prospective farmer required capital to acquire the tools that made production possible, many parcels frequently came under the control of few financiers (who, foreseeing the potential of the region, underwrote the pioneer) and, as a result, tenancy has always been a trait of the Corn Belt. This is not untrue today and might well become increasingly characteristic in the future: a couple of hundred acres of land which with structures, machinery, and stock comprise several hundreds of thousands of dollars cannot be within the grasp of many young farmers. Factory farms are the order of the day and the latest in a series of patterns in a prairie state.

F. SUMMARY

In sum, if we were to diagram the structure of geography, we might devise something along the following lines:

FUNDAMENTAL IDEA RELATIONSHIPS OF GEOGRAPHY



First- and Second- Hand Knowledge

fieldwork mapping expository reports

photo-interpretation

statistical techniques

constitute

GEOGRAPHIC FACTS

which on a certain

SCALE

constitute

GEOGRAPHIC DISTRIBUTIONS

which on a certain

SCALE

via

AREAL ASSOCIATION
constituting
FORMAL REGIONS
of
Accordant Features

SPATIAL INTERACTION
constituting
FUNCTIONAL REGIONS
tied together by
Patterns of Circulation

help to explain

AREAL DIFFERENTIATION